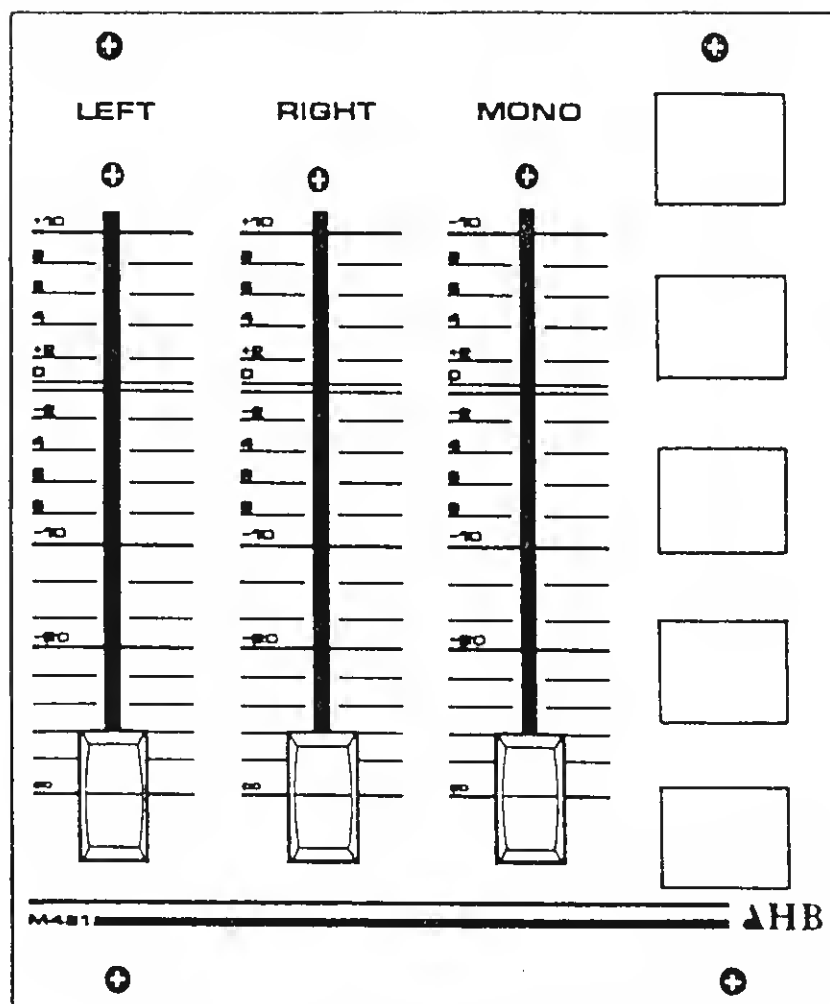


SIGMA SERIES STANDARD COMPONENTS

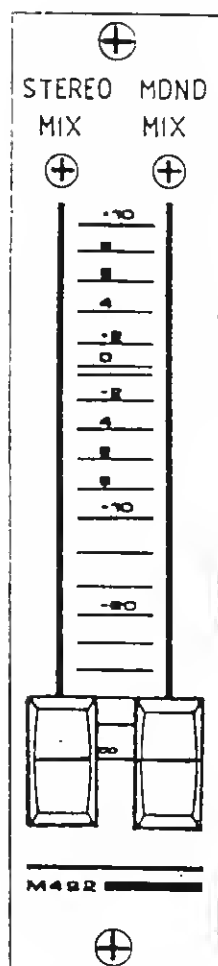
	ORDER CODE
48 position mainframe: 24 track VU meters, includes stand and hardwood trims	24L24TRVU
48 position mainframe: 16 track VU meters, includes stand and hardwood trims	24L16TRVU
48 position mainframe: 24 track bargraph meters, includes stand and hardwood trims	24L24TR8G
48 position mainframe: 32 track bargraph meters, includes stand and hardwood trims	24L32TRBG
36 position mainframe: 16 track VU meters, includes stand and hardwood trims	24S16TRVU
36 position mainframe: 24 track bargraph meters, includes stand and hardwood trims	24S24TRBG
12 position extender frame: no metering, includes stand and hardwood trims	24X
Sigma power supply 3U 19" chassis 110, 120, 220, 240V AC operation	RPS2
OC power supply connecting cable: 6 meter length (PSU to mainframe)	OC CABLE 6
OC power supply connecting cable: 3 meter length (mainframe to extender frame)	OC CABLE 3
Busbar connecting cable assembly (mainframe to extender frame)	BUSX
Stereo output master module assembly M440, double width 76mm, 6 aux outputs	M440
Stereo output master module assembly M441, double width 76mm, 8 aux outputs	M441
Monitor master module assembly M450, double width 76mm	M450
Monitor master module assembly M451, as above with studio L.S. output	M451
Mono mic/line input module assembly M410, standard width 38mm	M410

Line input/output module assembly M420, standard width 38mm	M420
Dual output module assembly M430, standard width 38mm	M430
In-line input/output module assembly M470, standard width 38mm	M470
Fader module M485, standard width 100mm carbon	M485
Master fader module M481 for master module set, quad width 154mm	M481
Master fader module M492 for master module set	M492
M482 fader assembly 16 track for 8 X M430 modules	M482
M483 fader assembly 24 track for 12 X M430 modules	M483
M491 blank fader panel, standard width	M491
M493 switch panel, part of mute processor system	M493
M493X switch panel, seven blank positions	M493X
M494 mute processor control panel, double width	M494
Blank module panel, standard width	M400
M4SF single fader harness for M485	M4SF
M4TF twin fader harness for M482/483 assemblies	M4TF
Producers desk/patchbay frame: 19" capacity total 15U including stand and trim. Unwired	24PB
Fader automation options: refer to separate section	
AHB Sigma Series operating manual	24LOM
Sigma Series service kit	M4SK

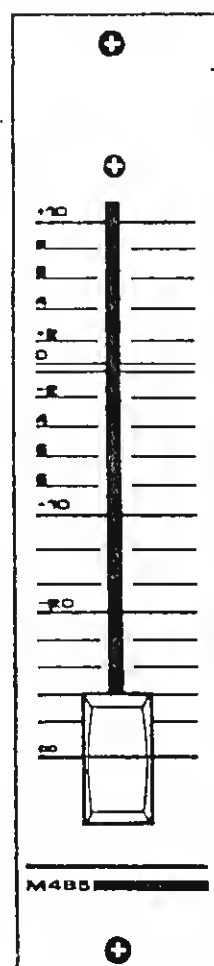


AUTO MUTE MAINFRAME, STANDARD PANEL.

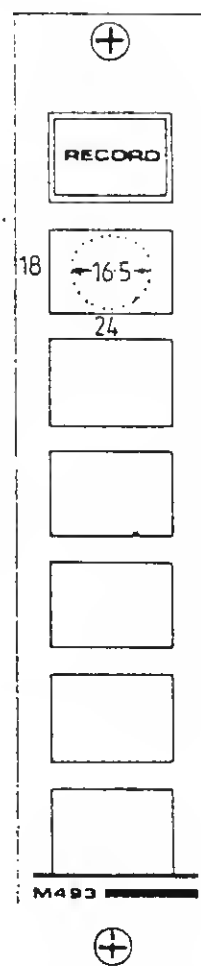
SIGMA
FADER SYSTEMS
100mm non-
automated types



OPTIONAL PANEL.
STANDARD ON MUTE-
PROCESSOR MAINFRAME



STANDARD SINGLE
FADER.



PART OF MUTE
PROCESSOR.

SWITCH BLANKS
6 off
for customer use

FADER SYSTEMS

- 1) Mainframes and extender frames have a fader bay area between the main modules and the arm rest and running the full width.
- 2) Access to fader bay is from the operating surface. The end and bottom panels are fixed.
- 3) Dimensions of the fader bay panel and fixings are shown in the diagram. Note that the standard panel width is 38mm. The 38.5 pitch provides clearance between adjacent panels.
- 4) Access to the fader bay includes:
 - (i) at each module position a plain hole 25mm (1") for the module fader audio harness.
 - (ii) cut outs in the bottom plate at each end for AHB SSR auto mute harnesses and fader automation harnesses.
 - (iii) cut outs in the vertical plate separating main modules and fader modules at each end and in the centre for use as required. Refer to the fader bay drawing for details.
- 5) Standard Sigma fader bay equipment is a 100mm carbon fader module type M485, each requires one fader harness type M45F.
- 6) Master fader module M481 is for M440 and M450 master module set. Note that M481 is four module widths and provides faders for left, right and mono outputs plus space for optional pushbutton switches as required.
- 7) Alternative master fader module M492 is fitted with mute processor main frames and provides stereo and mono faders, replacing the M481 module. This is also available as an option for all console versions.
- 8) Standard faders for M430 dual output sets are fader panel assemblies M482 for 16 track (8 X M430) and M483 for 24 track (12 X M430). These are single panels carrying all faders for the module set. Requires fader harnesses M4TF.
- 9) Where a single module blank is fitted a fader module blank, M480, is required.
- 10) Standard fader modules include a male connector to mate with the fader harness of the main module.
- 11) Optional faders are as follows:

Single Penny & Giles fader:	P&G3220, 10K log, M, plus knob. Fits M485 panel, with a slight calibration error.
Stereo master P & G fader:	P & G 3222, 10K log, M, 11mm red knob. Fits M492 panel and replaces the carbon stereo fader.
AHB VCA DC group system:	refer to fader automation details.
- 12) The fader bay includes DC power connection points for optional equipment. Refer to fader automation and SSR auto mute sections for details.

MODULE SYSTEMS

The module variety available at September 1987 comprises:

TYPE	FUNCTION	SYSTEM CAPACITY	WIDTH
M440 stereo master	Main stereo, auxiliary and cue outputs	One always fitted	2
M441 stereo master	As above, but 8 aux outputs		
M450 monitor master	Loudspeaker and head-phone monitor controls	One always fitted	2
M451 monitor master	as above with studio L.S. output		
M410 channel	Mono mic/line multi-track input	Any number 0 to 56	1
M420 output	Line input - output	Any number 0 to 56	1
M430 dual output	Dual output/monitor	Any number 0 to 56	1
M470 input-output	In-line system	Up to 56	
M485 fader panel	Single analogue 100mm fader	One per M410, M420, or M470	1
M481 master fader panel	L, R, mono output master faders	One per M440/M450 set	4
M492 master fader	Stereo and mono output faders	one per M441/M451 set	1
M491 fader blank	Blank	As required	1
M493 switch panel	Part of mute processor system	One per system	1
M400 module blank	Blank	As required	1
M493X switch panel	7 holes for customer use	As required	1
M482 fader panel	16 faders for 8 X M430	One or two	8
M483 fader panel	24 faders for 12 X M430	One	12
M494 control panel	Mute processor controller	One	2

Fader automation systems Replaces M485, refer to separate section for details As required for M410, M420 and M470 modules

Module types planned for introduction.

Stereo input	Stereo line input
Stereo input fader	Stereo 100mm fader with auxiliary controls
PA group	Output to replace M420 multitrack output
PA master	Matrix output master module

Note: M440/450 master modules will be supplied in split format consoles. M441/451 master modules will be supplied with in-line format consoles. The M440/450 combination will be discontinued in 1988.

Ordering Procedure

Arrive at the required operating system by reference to the following details.

- 1) Decide on the number of outputs required, meterbridges are available with 8, 16 and 24 output meters.
- 2) Chose the type of output module required either:
M420 line I/O module with EQ and multitrack routing. Automation capable.
M430 dual output with EQ but not multitrack routing or automation capable.
- 3) Decide on the number of M410 mono mic/line inputs required.
- 4) Calculate the number of modules required as follows:

<u>Module</u>	<u>Qty</u>	<u>Frame Space</u>
M410	N	N
M420 1 output per module	X	X
M430 2 outputs per module	16 or 24	8 or 12 Y
M440 Stereo output master	1	2
M450 Monitor master	1	2

	total module positions	N+X+Y+4

- 5) Chose the combination of main and extender frames that has capacity for this figure:

Mainframe capacity	48 positions total
Extender capacity	12 positions total

If the sum total (4) is less than (5) request blanks to fill the spaces.

- 6) Decide how modules are to be arranged in the frames. Suggested line input - output formats start at 1 on the left and go to 44 (56) on the right. Since modules may be put anywhere you may choose to have the line I/O monitors 1-16 or 24 in the centre of the combination. Specify a "centred line I/O format". Suggested conventional group formats have M410 1 on the left and outputs M420 or M430 on the right, with masters in between. Specify "conventional group format".

Faders

- 1) Unless specified the console will include non automated 100mm faders at all module positions.
- 2) For modules M410 and M420 one fader module M485 is required per main module.
- 3) Fader blank M491 accompanies module blank M400.
- 4) For modules M430 in sets of 16 or 24 outputs fader panels M482 (16) and M483 (24) will be supplied.
- 5) All console formats include one fader master panel M481 to accompany master module set M440 and M450.
- 6) To order consoles with VCA fader system specify 'Sigma with fader automation'. Refer to 'fader automations' section.

Example of Console Format

- 1) 24 track non automated line input - output system:

M420 module qty:	24
M410 module qty:	20
Master module set:	4+
	--
total positions used	48
	--
24L mainframe capacity	48
	--

Order: Sigma 24L 24 track 20 M410, 24 M420, line I/O format, non automated.
or: Sigma 24L 24 track 20 M410, 24 M420, centred line I/O format, non automated.

2) 24 track automated line input - output system:

M420 module qty:	24
M410 module qty:	32
Master module set:	4+
	--
total positions used	60
	--
24L mainframe and extender capacity	60
	--

Fader automation system AHB VCA DC group:

M420 fader automation:	24
M410 fader automation:	32+
	--
total faders M487	56
	--
VCA master fader M488	1+
	--
total faders	57
	--
M485 non automated L, R, mono faders	3+
	--
total positions used	60
	--

Order: Sigma 24L 24 track 32 M410, 24 M420, line I/O format, left hand extender.

AHB VCA fader: all M410, all M420.

3) 16 track conventional system, non automated

M430 module qty (16 outputs):	8
M410 module qty:	24
Master module set:	4+
	--
total positions used	36
	--
24S mainframe capacity	36
	--

Order: Sigma 24S 16 track 24 M410, 8 M430, conventional group format, non automated.

- 4) Dual 16 track conventional system,
 automated, for 2 X 16 track synchronised
 M430 module qty (32 outputs):
 M410 module qty:
 Master module set:

16
 40
 4+

total positions used

--
 60

24L mainframe and extender capacity

--
 60
 --

Fader automation system AHB VCA DC group:

M410 fader automation

40

M430 fader automation

not available

total faders M487

--
 40

VCA master fader M488

--
 1+

total fader automation positions

--
 41

Non automated L, R, Mono faders M485

--
 3

Non automated output faders M482 X 2

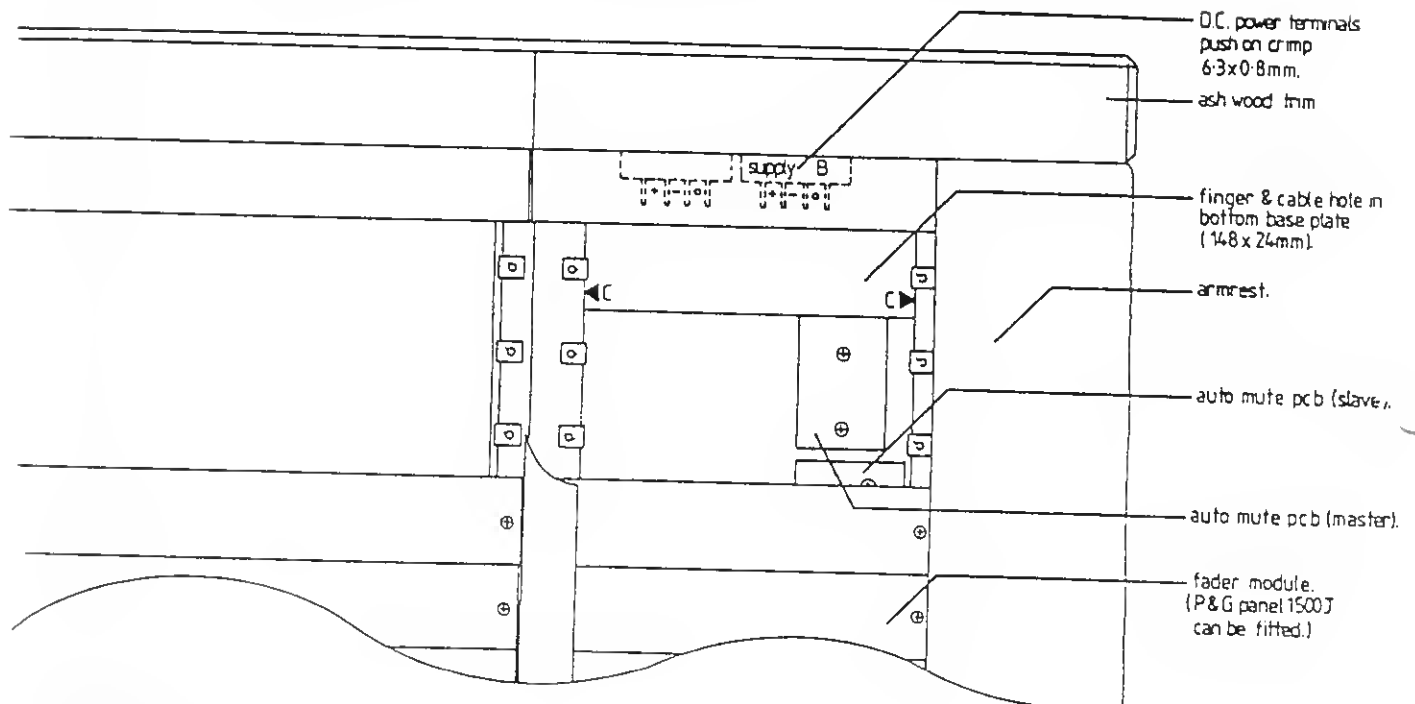
16

total fader positions

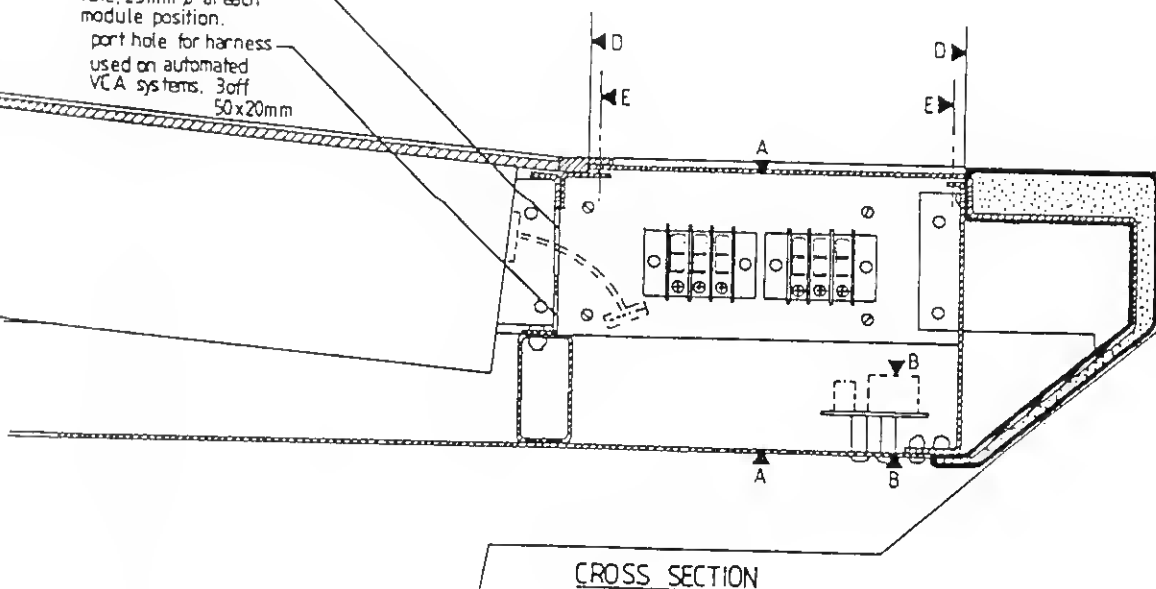
--
 60
 --

Order: Sigma 24L dual 16 track, 40 M410, 16 M430, conventional group
 format, left hand extender.
 AHB VCA fader all M410 positions.

SIGMA SERIES FADER BAY ARRANGEMENT
RIGHT HAND SIDE OF MAINFRAME TOP ELEVATION WITH 3 FADER PANELS REMOVED.



fader harness port hole, 25mm ϕ at each module position.
 port hole for harness used on automated VCA systems, 3off 50x20mm



INTERNAL DIMENSIONS

	mm	inches
A =	130	5.11
B =	30	1.18
C =	160	6.29
D =	178	7
E =	168.4	6.6

FADER AUTOMATION SYSTEMS

- 1) All Sigma consoles include provision for automation of fader and mute.
- 2) Modules M410 input and M420 Line I/O and M470 can accept fader automation.
- 3) Master module left, right and mono output faders can be automated, however this requirement is not foreseen.
- 4) Module M430 dual output cannot accept fader automation modules due to the closer spacing of the two faders required per M430 module.
- 5) There are two levels of fader automation:
 - i) VCA DC grouping, no memory of fader position is created.
 - ii) Fader automation with memory storage and recall of fader position synchronised to the audio programme, eg. VCA fader modules with data storage on multitrack; VCA fader modules with data storage in computer memory; 'moving fader' servo systems with data storage in computer memory.
- 6) Sigma Series mainframes include space in the fader bay for the location of hardware for both types of fader automation. Analogue faders M485 are replaced with automated fader modules. The fader module panel and fader bay capacity are shown in the illustration. The fader module panel is a Penny & Giles standard panel size 1500 series J option.
- 7) Consoles delivered non-automated can be modified later to include fader automation.

FADER AUTOMATION: Other Systems

AHB Sigma Series consoles will accept other-brand fader automation which meets the following criteria:

- 1) The active fader modules fit the fader bay, see diagram. Panel width is 38mm, pitch is 38.5mm.
- 2) There is space allowed in the fader bay for additional fader automation control modules that may be needed.
- 3) The gain structure of the modules can provide 10dB attenuation between audio input and output at normal fader position.
- 4) The system is provided with DC power and does not draw power from the console PSU.
- 5) Audio input and output connections are compatible with the AHB fader interface. This employs 'Molex' type 0.1" pitch female headers on a flying lead from each main audio module. The module send to fader is 0dBv from 22 ohms, the return from fader is -10dBv into 10k ohms when set for unity gain panel indication.

AHB will be pleased to provide quotations for individual systems and can supply some systems ready installed for use on delivery of the console.

When selecting the system account should be made of value for money, inter-studio compatibility and after sales service. The manufacturers guarantee for after sales service is negotiated to be transferred to the end user in the country of use. Where this is not possible AHB will advise the individual circumstances.

Mastermix by Audio Kinetics, with Digital Grouping.

Mastermix uses high quality VCA fader modules and computer programs to generate fader position information which is stored on floppy disk and SMPTE/EBU timecode is used on one track of the audio recorder to synchronise fader events with the program.

Mastermix MX200 type fader modules replace AHB M485 non-automated faders. The Mastermix fader controller is located alongside the console MONO output fader beneath the M450 module. Fader modules are finished to match Sigma panels.

Mastermix fader interface hardware occupies 3U of rack space in the console patchbay. The Mastermix Automation Computer and Automation power supply may be located in the console patchbay or in a wall patchbay. The Mastermix controller is a portable device which is positioned as required.

Mastermix is available ready installed on ex-works consoles or may be retrofitted at a later date.

Variations arise from the number of channels to be automated and from patchbay location to the left or right of the console.

No modification to console audio modules is involved.

For each fader which is automated the analogue fader harness M4SF is replaced with automation fader harness M4AF.

The Mastermix maximum capacity is 64 faders, an extended Sigma console can accommodate 56 automated faders. Your dealer will provide the Audio Kinetics literature on request.

The Audio Kinetics hardware required is as follows:

<u>UNIT</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>
COMPUTER	MMM012	MX 644 Mastermix Computer System comprising: -AMM010 Mastermix Computer -AMM100 Remote Controller -AAM020 Controller Cable - 8m -AAM010 Computer/Interface Cable - 8m -10 Mastermix Format 5.25" floppy discs -Operating Manual
CONSOLE INTERFACES		<u>MX700 SERIES for Digital Grouping Faders</u> MMK716 16 Channel with Enclosure MMK732 32 Channel with Enclosure MMK748 48 Channel with Enclosure MMK764 64 Channel with Enclosure

DIGITAL
GROUPING
FADERS

MX 200 Series Mastermix Faders:

MX200 178mm x 38mm, AHB Sigma finish

FADER
CONTROLLER

178mm x 38mm, AHB Sigma finish

POWER
SUPPLY

AMM301(UL) Mastermix Power Supply Unit for Interface
and Faders in 3U Enclosure

INSTALLATION
KITS

Audio Kinetics Fader/Full Retrofit
ADM001 Fader Installation Kit, per 16 channels
AOM002 Fader Installation Kit, per 8 channels
AOM003 Fader Control Installation Kit
AOM006 Earth Kit

ACCESSORIES

XMD102 Formatting Disc
ACE252 16 Channel Digitiser Card, Digital Grouping
ACE280 32 Channel DC Card Assembly

MASTERMIX - SOME QUESTIONS ANSWERED

Q. What consoles can I fit Mastermix to?

A. The list is long, and includes AHB (Sigma Series), Amek (2500, Angela, APC), Cadac, Calrec (U8000), DDA (AMR24), Harrison (MR2, MR3, MR4, Raven, 32C), MC1 (JH600), Neotek (Series 3, Elite), Neve (most models), Soundcraft (TS24 + 2400), Studer (900), Trident (Series 80, TSM and D1-AN), if in doubt please ask us.

Q. Why is there a feature difference between DC and Digital Grouping Systems?

A. The VCA Fader fitted to most DC Grouping Automation Ready Consoles do not allow computer control of the fader functions (Read, Write, etc). The Grouping on these faders is hard-wired, selected by switches on the fader (hence the 'DC'). Digital systems offer much more flexibility, and more 'automatic' operation.

Q. Is there a display of VCA levels available?

A. Yes, a new Audio Kinetics display interface will shortly be available and there are systems available from other manufacturers (eg. Audioscope or EMT) which can be fitted to read the VCA DC levels.

Q. In normal operation, should I use WRITE or UPDATE?

A. Use WRITE as much as possible. Remember that UPDATE only modifies existing fader movements, so it will not erase mistakes or wrong level changes, only add to them. You will probably need UPDATE near the end of the session.

Q. How long is the memory - how much of a mix can I store?

A. This depends on how many channels there are on the console, and how busy the mix is, but typically, each memory can store 1/2 hour of an average-to-busy mix. It is unlikely that you would run out of memory on a music track, or even several tracks.

Q. What is the accuracy of the VCA level in Replay?

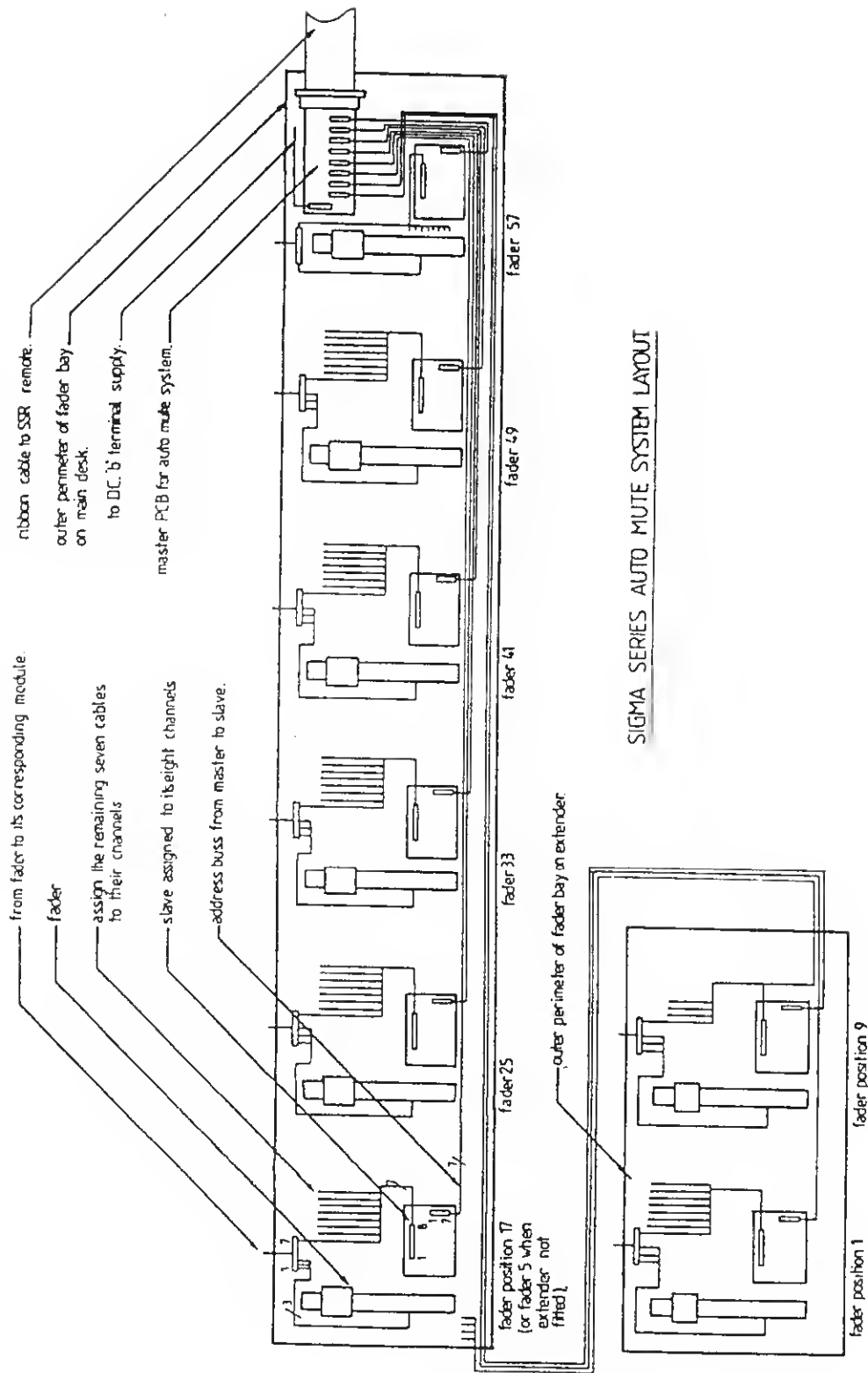
A. The resolution of the VCA control is 1 part in 256. This means that the level will be within $\pm 1/3$ dB of the original each time. This is not added to on successive updates.

Q. How often are the faders scanned?

A. The whole fader section is scanned once every frame (1/25 or 1/30 of a second) so all level change and mutes will be written within that time.

Q. Why only 4 memories?

A. Although it seems a small number, remember that this is 4 complete mixes, unlike other systems where each memory is a defined segment and have to be joined together at the end. The length of the mix is defined automatically by the timecodes you play over, so you do not have to define anything directly.



SIGMA SERIES AUTO MUTE SYSTEM LAYOUT

SSR AUTOMUTE SYSTEM

AHB SSR Automute System: ordering and installation.

The system is supplied ready to use with the console.
The system comprises:

- 1 control unit
- 1 connecting cable to console fader bay
- 1 automute master pcb assembly
- 8 automute slave pcb assembly
- 1 set internal harness

refer to the illustration of fader bay wiring for the system.

Automute operates fader mutes of M410 modules and M420/430 monitor sections.

Installation

The relationship between console module and automute channel is shown for several typical consoles below:

Model	Automute channel numbers	
	Input Sequence	Monitor Sequence
24L 20 X 24 (410/420)	1-20	21-44
24L 28 X 16 (410/420)	1-28	29-44
24L 32 X 24 (410/420)	1-32	33-56
24L 32 X 24 (410/430)	1-32	33-55 ODD
		34-56 EVEN

Note that while it is safe to unplug the control unit cable with power on this will lock the last operating status. Reconnection with power on will reset the system to the status of mute patch '0'. If power is applied without the SSR control unit being connected then a random pattern of mutes will result. To run the system without control unit lift the 3 pin DC plug from the Automute master pcb in the right hand end of the fader bay.

POWER SUPPLY

AH8 power supply model RPS2 is supplied with all Sigma Series systems.

Dimensions: 19" rack chassis, 3U height, 400mm (15 3/4") behind panel.

Construction: Alloy and steel case. Painted front panel with legend.

Connections: AC inlet at rear, IEC 3 pin male panel connector.
 DC outlet at rear, 8 pin female connector.
 Use AH8 Sigma DC connecting cables only.
 AC fuses on front panel. OC fuses inside.
 AC requirement: single phase 50/60Hz
 110, 120, 220, 240V AC input.

Nominal	Range
110	100 - 110
120	110 - 120
220	200 - 220
240	220 - 240

DC Outputs: Audio supply 'A' +16V @ 5A smoothed and regulated.
 Supply B +15V @ 3A smoothed and regulated.
 Phantom power supply +48V @ 0.2A smoothed and regulated.
 All outputs short circuit protected.

Ventilation: Heatsinks at rear require free air flow.

Connecting Cables: Mainframe to PSU 6 meter (20ft) length.
 Mainframe to extender 3 meter (10ft) length.

Earthing: PSU case is connected to the AC inlet earth.
 DC outputs DO NOT INCLUDE AC EARTH.
 Mainframes carry a binding post terminal for the connection
 of studio technical earth.

Health & Safety
Warning:

Lethal voltages exist inside this equipment.
Disconnect AC supply before removing covers.
Protect from moisture.